

APPLICATION NO. 09/826,277  
DOCKET NO. N8753**REMARKS**

Claim 1-16 have are pending in the above-captioned application. In addition, by amendment herein, claims 17 and 18 have been added. Moreover, claims 1 and 10 have been amended herein in order to more clearly define and fully protect Applicant's invention.

It is acknowledged that this Response is being filed after final rejection. However, since it is believed that the amendments made herein place all pending claims 1-18 in condition for allowance, entry of these amendments is believed appropriate and is respectfully requested.

Support for the amendments made herein as well as added claims 17 and 18 can be found in the specification at page 5, line 29 through page 6, line 8.

**Prior Art Rejections**

Claims 1-16 stand rejected under 35 U.S.C. §102(b) as anticipated by, or, in the alternative, under 35 U.S.C. §103(a) as obvious over Howard (U.S. 4,961,991), in view of Atkinson et al. (U.S. 4, 591,166) and "typical GRAFOIL® sheet properties."

As pointed out in the response filed November 18, 2002, the need for the citation of secondary references Atkinson et al. and "typical GRAFOIL® sheet properties" is indicative of the fact that Howard cannot and does not anticipate the claims of the above-captioned application. In any event, it is clear that Howard not

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only does not disclose every element of the rejected claims, but also contains no suggestion of the invention of the rejected claims.

The Official Action asserts that Howard discloses a material which comprises a void-free flexible graphite sheet and cites col. 2, lines 16-61 for this assertion. In addition, the Official Action further asserts that the asserted flexible graphite sheet of Howard is impregnated with a phenolic-based resin (citing col. 2, lines 25-61). This is simply not the case. What is disclosed by Howard at col. 2 is a laminate containing flexible graphite sheets as well as a woven or non-woven cloth sandwiched between the graphite. It is the cloth that is void-free and resin-impregnated. This is made clear from col. 2, lines 58-61, where Howard states that "The polymer resin is primarily used to fill and coat the cloth so that not only are the fibers coated, but also any space between the fibers are completely filled with the resin. This will produce a nonporous cloth..." (emphasis added). Thus, the element of the Howard laminate which is void-free is the cloth sandwiched between the flexible graphite, not the sheets of flexible graphite.

Although Howard discloses that the cloth can be formed from "carbon fibers such as graphite" (col. 2, line 19), these carbon fibers are formed of synthetic graphite, that is carbon which has been subjected to graphitization times and temperatures sufficient to form a more highly crystalline structure. This is different both in form and substance from the sheets formed of compressed particles of exfoliated graphite of the present invention.

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Thus, while Howard does use flexible graphite sheets in the disclosed laminate, those flexible graphite sheets are not disclosed as void-free. What is rendered void-free in the Howard disclosure is a woven or nonwoven cloth which can be formed of a synthetic graphite material, as opposed to a flexible graphite sheet. Thus, Howard cannot anticipate the invention of claims 1-16 (now 1-18) and the disclosures of either Atkinson et al. or "typical GRAFOIL® sheet properties" cannot so alter the Howard teaching, even if the combination of the Official Action were made, to suggest the claimed invention.

In addition, it must be stressed that the claimed invention is not simply a flexible graphite sheet having a void-free condition. Rather, the inventive sheet is one where the void condition is selected so as to achieve a particular morphology after embossing. As discussed in the specification at pages 5 and 6, depending on the morphology of the embossed sheet, different characteristics, such as degrees of thermal or electrical anisotropy, can be obtained. This can be highly significant depending on the particular end use and characteristics desired. For instance, certain levels of thermal or electrical anisotropy may be desired for certain fuel cell components.

Although a void-free condition may provide certain specific characteristics, the invention lies in the fact that the void condition of the sheet, whether void-free or with a certain void level, can be used to tailor the morphology of the embossed sheet to thus engineer characteristics that may be desired. Nothing of the sort is disclosed or even remotely suggested by Howard or the secondary references. Thus, the rejection under

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35 U.S.C. §102(b), or in the alternative, 35 U.S.C. §103(a), over Howard in view of Atkinson et al. and "typical GRAFOIL® sheet properties" should be withdrawn.

Claims 1-3 and 10-12 stand rejected under 35 U.S.C. §102(b) as anticipated by, or in the alternative, under 35 U.S.C. §103(a) as obvious over Mercuri (U.S. 6,017,633) in view of Atkinson et al.

Again, it is pointed out that the need for the citation of the secondary reference Atkinson et al. is clear proof that Mercuri does not and cannot anticipate the inventions of the rejected claims.

More importantly, Mercuri, even taken in combination with Atkinson et al., does not even remotely suggest the invention of the above-captioned application.

The Official Action points to col. 5, lines 20-29 of Mercuri for the assertion that Mercuri discloses a void-free flexible graphite sheet and that the process for manipulating the void condition to produce a relatively void-free sheet is disclosed. That is not what is stated in the cited portion of Mercuri. What Mercuri states is that "the sheet of Fig. 7, in accordance with the present invention is of uniform density and thickness and contains no acceptable [clearly "unacceptable" is meant] voids or fissures. Thus, Mercuri does not disclose the production of a void-free material, but, rather a material in which a not unacceptable level of voids is present. Reading the cited portion of Mercuri any other way makes no sense, because then it would state that there are no "acceptable" voids or fissures, without any explanation of what an acceptable void is nor why one would not want any since they are described as acceptable in the patent.

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More importantly, even if Mercuri were read to disclose a sheet of flexible graphite having no voids, there still remains no disclosure of the manipulation of void condition to produce desired morphologies. As noted above, although certain morphologies which can be desirable in certain circumstances are achieved by producing a void-free sheet, the invention contemplates certain void conditions other than void-free to provide other morphologies and thus produce other characteristics which can be desirable in other circumstances. As discussed in the specification, the anisotropic ratio (the ratio of in-plane conductivity to through-plane conductivity) can be a significant factor, especially in fuel cell components. The manipulation of void conditions to produce predetermined morphologies can tailor the anisotropic ratio to particular situations. This is not disclosed or even hinted at in Mercuri, even if combined with Atkinson et al.

Thus, the rejection of claims 1-3 and 10-12 over Mercuri in view of Atkinson et al., whether under 35 U.S.C. §102(b) or under 35 U.S.C. §103(a) should be withdrawn.

Although, as asserted above, it is believed that entry of this action and its amendments is appropriate because all claims 1-18 are placed in condition for allowance, Applicant is also at this time filing a request for continued examination in case allowance of the claims is not forthcoming. Entry of this amendment in the continued examination is therefore requested in the alternative.

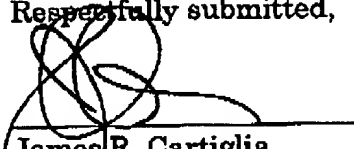
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DOCKET NO. N8753**CONCLUSION**

Based on the foregoing amendments and remarks, it is believed that all pending claims 1-18 are in condition for allowance. Such action is earnestly sought. If there remains any matter which prevents the allowance of any of these claims, the Examiner is requested to call the undersigned, collect, at 615-242-2400 to arrange for an interview which may expedite prosecution.

Pursuant to 37 C.F.R. § 1.136(a), Applicant petitions the Commissioner to extend the time for responding to the February 7, 2003, Office Action for 2 months from May 7, 2003, to July 7, 2003. Commissioner is authorized to charge the fee for this request, in the amount of \$410, to deposit account 50-1202.

The Commissioner is authorized to charge any deficiency or credit any overpayment associated with the filing of this Response to Deposit Account 50-1202.

Respectfully submitted,

  
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